# Vocabulary Retention of Third Grade Students from Low-Income Homes Following Second Grade Vocabulary Instruction

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## Abstract

This study examined vocabulary retention rates of 63 third grade students from low-income schools a year following instruction. Expressive labeling and decontextualized definition tasks were compared across years. Word knowledge on the decontextualized task went from 40% in second grade to 26% in third grade. Word knowledge on the expressive task went from 46% in second grade to 19% in third grade. Participants with high IQ scores (115 or higher) had superior retention rates especially for the expressive task. Participants with identified disabilities had lower retention rates than those without identified disabilities. Results indicated that this 15-minute supplement of vocabulary instruction was successful in increasing acquisition of rather challenging vocabulary with participants retaining much of their learned vocabulary one year after instruction without review or practice.

# Vocabulary Retention of Third Grade Students from Low-Income Homes Following Second Grade Vocabulary Instruction

Vocabulary learning is a crucial aspect of education. An extensive vocabulary background helps to build a foundation for reading acquisition, which correlates with greater academic achievement later in life (Cunningham & Stanovich, 1997). Cunningham and Stanovich (1997) found strong correlations between reading acquisition measured in first grade and measures of academic achievement including reading comprehension, vocabulary and general knowledge measured in eleventh grade.

In today's society there are vast differences in the vocabulary knowledge of children from different socioeconomic status (SES) groups (Hart & Risley, 1995). Children who come from low SES homes have fewer language building experiences, such as being read to on a regular basis, than their peers from higher SES homes (Hart & Risley, 1995). Researchers have found that children who come from lower SES homes start school knowing half as many words on average than those who come from middle class homes (Hart & Risley, 1995). These differences in vocabulary knowledge place children from lower SES homes at a higher risk for poor long-term academic success and for disability status (Walker, Greenwood, Hart, & Carta, 1994). Stanovich (1986) has described this pattern as the *Matthew effect*. Children entering kindergarten from lower SES homes with less vocabulary knowledge benefit less from vocabulary instruction, because they do not have the advantage of a strong vocabulary to start with, than children from higher SES homes with greater vocabulary knowledge (Stanovich, 1986; Walker et al., 1994).

Some researchers have focused their studies on teaching vocabulary specifically to children from lower SES homes, in an attempt to find strategies to close the gap between the

academic success rates of children from lower SES homes versus higher SES homes. For example, Beck and McKeown (2007) implemented a vocabulary intervention with eight classes of children in kindergarten and first grade from low SES homes. Their intervention used Text Talk, a read-aloud method, where new vocabulary words were introduced within the context of a story. First, the word was contextualized for its role in the story and then the meaning of the word was explained. The children were then asked to repeat the word. Next, examples in contexts other than the one used in the story were provided, and the students were asked to make judgments about the examples. The children were then asked to construct their own examples, and finally the students were asked to provide the word when given the definition. There were two groups of students: those who received this instruction, and those who received no instruction. The researchers found that students who received extensive vocabulary instruction learned more words than students who received no instruction.

In another study, Coyne, McCoach, Loftus, Zipoli, and Kapp (2009) conducted a vocabulary intervention with kindergarten students, 65% of who were eligible for free or reduced-priced lunch. In the intervention, the researchers read aloud to the students and varied the amount of time that they dedicated to teaching the new vocabulary introduced in the storybooks. The researchers used two methods of instruction: embedded instruction and extended instruction. In embedded instruction, the students were read a list of the target words before hearing a story, and were told to raise their hands throughout the story when they heard the target words. When they raised their hands while the story was being read, they heard a simple definition of the word, were asked to repeat the word, and then the story continued. In extended instruction, words were introduced and defined the same way they were in embedded instruction. However, once the story was completed, the participants did activities that allowed them to

experience the target words in different contexts. Coyne et al. (2009) found that there was a significant benefit to teaching words through explicit, extended instruction, as opposed to explicit, embedded instruction.

Researchers have investigated how vocabulary knowledge is gained through various opportunities for learning. These learning opportunities can be broken down into two main categories: implicit instruction and explicit instruction. Implicit instruction is when a child picks up the meaning of a word without the adult directly teaching it. For example, it would be considered implicit instruction if a child infers the definition of a word using contextual clues during silent reading or from listening to the teacher speak. Explicit instruction is when a teacher or adult purposely defines a word for a child (Marulis & Neuman, 2010). Explicit instruction can be broken down further into two methods of teaching vocabulary: embedded instruction and extended instruction. Embedded instruction teaches new words within the context of a storybook or another activity. For example, when a teacher is reading aloud to the students and a new vocabulary word is introduced, the definition is given within the story and then the story is continued. This type of instruction is a time efficient strategy to teach a broad spectrum of words. Extended instruction is more time intensive for the teacher and the students because it teaches vocabulary in depth by allowing the child to experience the word in several contexts, for example within different contexts of a storybook, within the classroom, etc. In contrast, embedded instruction is taught only within the one context of the storybook, with a larger number of words taught, and a shorter amount of time spent on each word (Coyne et al., 2009). In the Coyne et al. (2009) study, they found that explicit, extended instruction was the most effective method of teaching new vocabulary words to children. Explicit, extended instruction

allowed the students to demonstrate complete knowledge of words on average, whereas explicit, embedded instruction allowed the students to demonstrate only partial knowledge of words.

Marulis and Neuman (2010) recently reviewed the research on vocabulary instruction of pre-kindergarten and kindergarten children. In this meta-analysis, they examined the effects of vocabulary interventions on the growth and development of children's receptive and expressive language. They found that children's oral language development benefited strongly from these interventions. They calculated an overall effect size of 0.88, which is a significant gain in language ability. Marulis and Neuman also found that vocabulary interventions that used explicit instruction, in which the children were explicitly taught the definitions of words, were much more effective in teaching children new words than those that used implicit instruction, where the children were required to rely on contextual clues to learn words. Marulis and Neuman argue that further research on vocabulary intervention is needed to improve the effectiveness of these language intervention efforts. In particular, information must be gathered on what words and how many words need to be taught to maximize the effects of successful interventions (Marulis & Neuman, 2010).

Beck, McKeown and Kucan (2002) classify vocabulary words into three tiers. Tier 1 words (e.g., baby, happy) are the most basic words that are encountered in everyday life and are naturally learned by most children. Tier 2 words (e.g., coincidence, fortunate) are words that are experienced less often and may be more difficult to learn but are considered to have long-term academic benefits. These words seem to be especially valuable words because they can be used often and in various contexts (Beck et al., 2002). Tier 3 words are the most difficult words to learn and are not commonly used because they are primarily specialty words (e.g. isotope, peninsula). Many vocabulary intervention studies teach Tier 2 words because of the potential for

long-term academic benefits. Beck and McKeown (2007) and Coyne et al. (2009) both chose to teach Tier 2 words in their vocabulary interventions (Beck et al., 2002; Beck & McKeown, 2007; Coyne et al., 2009).

Teaching children the vocabulary words with the greatest potential for long-term benefits appears to be the most logical and beneficial method vocabulary instruction. However, if children are not likely to encounter or use Tier 2 words until later in development, then long-term benefits might be questioned. This concern may be decreased or increased depending on whether children tend to remember these words. If students do not retain the vocabulary words they are taught, then a different form of intervention may be more useful. There have been very few studies that follow children and examine the long-term retention of new vocabulary words. For example, Coyne et al. (2009) included a follow-up assessment 8 weeks after vocabulary intervention and examined the effect of time on the student's retention of receptive and expressive definitions. Results showed that the receptive definitions were not affected by time. The expressive definitions measure was only significantly affected by time for the children who were taught the words through embedded instruction. These results indicated that the children still maintained general knowledge of the words and recognized the definitions regardless of whether they were taught through embedded or extended instruction, but in order for words to be thoroughly learned and retained, the students needed to be taught through extended instruction (Coyne et al., 2009).

There have been several vocabulary interventions that have conducted posttests to measure retention of newly learned words. Loftus, Coyne, McCoach, Zipoli, and Pullen (2010) conducted a recent study to evaluate the effectiveness of a supplemental vocabulary intervention for kindergarten students who they classified as being at-risk for language and literacy

difficulties. In this study, they compared students who received both classroom intervention and the supplemental intervention with those who only received the classroom intervention. They used four methods of testing word knowledge: word recognition, picture vocabulary, context questions, and expressive definitions. Word recognition was used to assess the most basic level of word knowledge. The examiner read a list containing both target words and nonsense words and the participants had to indicate whether they had heard the word before. The picture vocabulary measure assessed the student's ability to identify a picture that represented a target word. The student was presented with four pictures and asked to point to the one that corresponded with the target word. The context questions measure assessed a student's ability to respond to a question that contained the target word. For example, if the target word were *saunter*, the examiner asked, "When would a teacher tell you to *saunter* in the hallway?" Finally, the expressive definitions measure assessed the student's ability to provide the definition of a target word. For example, "What does *saunter* mean?" The at-risk students scored significantly higher when they received the supplemental intervention on all of the methods of testing except picture vocabulary. Loftus et al. also conducted a delayed posttest 7 weeks after the intervention to measure the effects of time on the vocabulary retention. They found that the students' scores remained statistically the same 7 weeks after the intervention (Loftus et al., 2010).

In a similar study, Pullen, Tuckwiller, Konold, Maynard and Coyne (2010) also included a posttest in their study designed to measure retention. The purpose of the study was to evaluate the effectiveness of a tiered intervention model for vocabulary instruction, where the students who were struggling the most with learning new words received the most intensified instruction. In the study, the researchers first measured expressive word knowledge by simply asking the participants to provide the definition of a given word. For example, "Tell me what the word

*saunter* means." Next, the researchers measured contextual word knowledge by asking the participants to respond to contextualized questions. For example, "When is a time that you would be *quivering*?" Finally, the researchers measured receptive word knowledge by asking the participants to point to a picture that best represented the target word. For example, "Point to *veranda*." Pullen et al. found that the at-risk students lost their learned vocabulary knowledge over time, whereas the not-at-risk students did not.

In another study, Biemiller and Boote's (2006) vocabulary intervention study also included a delayed posttest. This posttest was conducted 6 weeks after the intervention was completed. They found that all of their students, ranging from kindergarten through Grade 2, actually gained word knowledge from their immediate posttest (conducted at the end of the intervention) to their delayed posttest. Biemiller and Boote speculated that "word consciousness," when students and teachers seem to be more in tune to noticing words, was probably very high for the vocabulary words that were taught in the intervention. Therefore, learning and knowledge increased after the intervention was completed because the students and teachers were more likely to notice them and point them out.

To justify continued efforts to teach challenging words to children, one might want assurance that these words are being retained over a longer period of time and therefore serving their purpose of having potential long-term benefits for students. The purpose of this study was to examine third grade students' long-term retention measured one year after vocabulary instruction of challenging words like Beck and McKeown's (2007) Tier 2 words. Information from multiple measures of vocabulary knowledge gathered immediately after intervention and a year later were analyzed to answer the following research questions:

1. To what extent did word knowledge decrease, increase, or remain stable from second to third grade?

2. Do retention rates of target vocabulary words differ for students with high IQ scores (greater than 115) than participants with average or low IQ scores (less than 115)?

3. Do students with identified disabilities have lower retention rates of target vocabulary words than participants without identified disabilities?

This study characterizes the extent of knowledge of words on average and how it changed from initial acquisition of novel words to retention a year later. This study provides useful information about how much information students retained over an extended period of time, and some insight into whether using challenging words like Beck & McKeown's (2007) Tier 2 words served its purpose. We predicted that participants with IQ scores above 115 would have higher retention rates than other participants. We also predicted that participants with identified disabilities would have lower retention rates than participants without identified disabilities.

## Method

### Participants

Sixty-three third grade students from two elementary schools in Florida participated. Participants included a total of 39 males and 24 females. The elementary schools primarily served families who were eligible for reduced or free lunch. In the study, 90% of the participants were eligible for free or reduced lunch. The ethnicity of the participants was largely Black (75%) followed by White (10%), Multiracial (8%), Hispanic (6%) and Asian American (1%). Fourteen participants had identified disabilities. Ten participants were identified as language impaired, 2 participants were identified as speech impaired, 1 participant was identified as specific learning

disabled, and 1 participant was classified as both language impaired and educable mentally handicapped.

All participants were administered the Kaufman Brief Intelligence Test (KBIT-2; Kaufman & Kaufman, 2005) to measure intelligence. The KBIT-2 measures verbal and nonverbal intelligence across all age groups to yield an overall intelligence score, known as the IQ (intelligence quotient) Composite. They were also given two language tests: the Peabody Picture Vocabulary Test (PPVT-4; Dunn & Dunn, 2007) and the Expressive Vocabulary Test (EVT-2; Williams, 1997). The PPVT-4 measures the receptive vocabulary of a subject by asking them to choose the picture that best represents the meaning of the target that the examiner presents verbally (PPVT-4; Dunn & Dunn, 2007). The EVT-2 measures expressive vocabulary and word retrieval by having the examiner present a picture to the subject and then asking the subject to respond with a word that provides an acceptable label for the picture. An acceptable label is one that answers a specific question about the picture or provides a synonym for a word that fits the pictured context (Williams, 1997). Table 1 provides a summary of the demographic information and test scores of the participants.

**Procedures**

Participants in the study received a vocabulary intervention in second grade. Their retention of the words taught in the vocabulary intervention was measured a year later in third grade. This paper will focus on the retention of words.

**Intervention.** In second grade, vocabulary intervention was delivered 4 days per week, for 18 weeks throughout the school year. The participants sat at their desks and listened through headphones to interactive stories with vocabulary lessons embedded. Each classroom had one CD player and each participant was given a pair of wireless headphones. All participants listened

to the same stories and instructions through headphones, so the treatment fidelity was high. Every day, each participant was given a packet with a copy of a decodable book from the *Open Court Curriculum,* a worksheet for the intervention, and a pencil. First, all the participants listened to a story and read long with a narrator. Next, they listened to an interactive story with vocabulary lessons that instructed them to follow along with their provided worksheets that had pictures that corresponded to the Tier 2 target words. Tier 2 target words were selected from *The Academic Word List* (AWL; Coxhead, 2000), because they represented words characterized as Tier 2 words by Beck et al. (2002). Vocabulary instruction involved asking participants to repeat words, repeat definitions, relate words to their lives, and write or draw on their worksheets. For example, the vocabulary lesson focused on the Tier 2 word "investigate" sounded like this:

> *Investigate* means to find out as much as possible. The men in the picture *investigated* the machine to learn more about it. The dog in the story *investigated* the balloon by biting it! He learned that it would pop, didn't he? Tell me about something you have *investigated*.

Each week, participants heard definitions and examples of six different novel, Tier 2 target words (2 nouns, 2 verbs, 2 adjectives or adverbs). The narrator said each target word at least eight times, four of which were exposures to the actual definition.

**Assessments.** Of the 146 participants involved in vocabulary intervention in second grade, 63 were available for testing at the end of third grade. Two types of vocabulary knowledge measurement tasks were used to measure the participants' retention of words taught in the vocabulary intervention the year prior. First, a *decontextualized definition* task involved responding to the prompt, "Tell me everything you know about (target word)." This represents a high level of knowledge as the child was asked to share knowledge when the word was not in context. Responses were scored as incorrect, partially correct, or correct. Incorrect was defined

as displaying no knowledge of the word, partially correct was defined as displaying some knowledge of the word, and correct was defined as displaying full knowledge of the word. For example, if the target word was “decade,” an example of an incorrect response would be “to un-cade something,” an example of a partially correct response would be “time,” and the acceptable correct response was “ten years.”

The second retention task was *expressive labeling* which involved producing the Tier 2 target word when presented with a picture and the taught definition. Expressive knowledge is an indication of word recall when contextual information is provided. Responses were scored as incorrect or correct. Incorrect was defined as failure to produce the Tier 2 target word when presented with a picture and a definition. Correct was defined as successfully producing the Tier 2 target word when presented with a picture and a definition. The examiner presented the picture and the definition and then asked, “What is this?” The participant would then have to provide the target word. For example, if the word was “decade,” the only acceptable response was “decade;” all other responses were considered incorrect.

During the second grade intervention, six words were taught per week for 18 weeks resulting in a total of 108 words taught. The words that were selected to be analyzed for retention were words that 25% to 75% of the children received a score of correct when given the decontextualized task in second grade. This way, words that nearly no one learned and nearly everyone learned were eliminated. A total of 42 words were selected for retention testing.

**Data Analysis**

The participants’ retention of the Tier 2 target vocabulary words was analyzed on an individual participant level using Microsoft Excel. The percentages of words that participants retained in third grade were analyzed and cross tabulated based on words for which they received

a score in second grade of incorrect, partially correct, or correct. The retention outcomes for the decontextualized measure are presented in Table 2 and the retention outcomes for the expressive measure are presented in Table 3. After each participant's retention data were analyzed individually, all of the data were converted into percentages. Then information from each cell was aggregated to determine the mean values for each cell.

The retention data of the participants with IQ scores below 115 was then compared to the retention data of participants with high IQ scores (115 and above). The retention data of the participants without disabilities was also compared to the retention data of participants with identified disabilities.

Figure 1 was created to help the reader interpret the retention data and relate it back to the research questions. Research Question 1 asked what percentage of word knowledge remained stable from second to third grade on average. This includes words that were scored as correct in second grade and correct again in third grade, words that were scored as partially correct in second grade and partially correct in third grade, and words that were scored as incorrect in second grade and incorrect again in third grade. As demonstrated in Figure 1, the percentages that fell along the diagonal represented stable word knowledge. Research Question 1 also asked what percentage of word knowledge decreased and increased from second to third grade. Figure 1 illustrates that the percentages on the top right represented a decrease in word knowledge. The percentages on the bottom left represented an increase in word knowledge.

## Results

Table 2 presents the results for the decontextualized task. To answer part of Research Question 1, to find the percentage of word knowledge that was stable from second to third grade, the percentages along the diagonal were summed (51% + 2% + 9%); 62% of word knowledge

was stable. To find the percentage of word knowledge that decreased from second to third grade, the percentages in the top right corner were summed (7% + 16% + 5%); 28% of word knowledge decreased. The percentages in the bottom left corner were summed to find the percentage of word knowledge that increased (4% + 5% + 1%); 10% of word knowledge increased.

Table 3 presents the results for expressive task. In answer to Research Question 1, 64% of word knowledge was stable from second to third grade, 32% of word knowledge decreased, and 5% of word knowledge increased from second to third grade.

Word knowledge decreased an average of 14% on the decontextualized task, and 27% on the expressive task. These percentages were calculated by finding the difference between the percentages of words scored as correct or partially correct in second and third grade on each task. For example, on the decontextualized task, 40% of words were scored as correct or partially correct in second grade, and in third grade this percentage dropped to 26%. If these percentages are converted into actual numbers of words, the result is that participants received a score of correct or partially correct on about 17 words in second grade on this task; they retained about 11 words in third grade and did not retain knowledge of 6 words on the decontextualized task. In contrast, on the expressive task, 46% of the words were scored as correct in second grade, and in third grade this percentage dropped to 19%. If one converts these percentages into actual numbers of words, one can see that participants received a score of correct on about 19 words in second grade; they retained about 8 words in third grade and did not retain knowledge of about 11 words on the expressive task.

To determine whether a high IQ score had an impact on the retention of word knowledge for the participants, Tables 4, 5, 6 and 7 were created and analyzed to determine percentage of word knowledge that increased, decreased, or remained stable on average for students with high

IQ scores. These averages were then compared to the averages for students with IQ scores lower than 115. Tables 4 and 5 display the average scores on the decontextualized and expressive tasks for the 7 participants with high IQ scores. Tables 6 and 7 display the average scores on the decontextualized and expressive tasks for the 56 participants who had IQ scores below 115. On the decontextualized task, participants with high IQ scores learned 65% of words in second grade versus 26% of words for the other children. Retention results show that participants with high IQ scores received scores of correct-correct (i.e., they received a score of correct in second grade and again in third grade) on 21% of words (see Table 4), whereas other participants received scores of correct-correct on 7% of words (see Table 6).

On the expressive task, participants with high IQ scores learned 67% of words in second grade, versus 43% of words for the other participants. Retention results show that participants with high IQ scores received scores of correct-correct on 32% of words (see Table 5), whereas other participants received scores of correct-correct on 12% of words (see Table 7). The higher number of words that were scored as correct-correct for the high IQ group demonstrates that the students with high IQ scores learned and retained the new vocabulary words at a higher rate than their classmates with an IQ score lower than 115.

To determine whether having an identified disability had an impact on the retention of word knowledge for the participants, Tables 8, 9, 10 and 11 were created and analyzed to determine the percentage of knowledge that increased, decreased, or remained stable on average for students with identified disabilities. These averages were then compared to the averages for students without identified disabilities. Tables 8 and 9 display the average scores on the decontextualized and expressive tasks for the 14 participants with identified disabilities. Tables 10 and 11 display the average scores on the decontextualized and expressive tasks for the 49

participants without identified disabilities. On the decontextualized task, participants with identified disabilities learned 24% of words in second grade, versus 32% correct for participants with no identified disabilities. Retention results show that participants with identified disabilities received scores of correct-correct on 7% of words, whereas participants without identified disabilities received scores of correct-correct on 9% of words. On the expressive task, participants with identified disabilities learned 37% of words in second grade versus 48% correct for participants without identified disabilities. Retention results show that participants with identified disabilities received scores of correct-correct on 9% of words, whereas participants without identified disabilities received scores of correct-correct on 15% of words.

## Discussion

It is essential to measure retention to determine whether teaching challenging vocabulary words is serving its purpose of having long-term benefits for students. Students from low-income homes are particularly vulnerable to the possibility of having poor long-term academic success (Walker et al., 1994). There have been very few studies that have measured students' retention rates of vocabulary words learned in the classroom over an extended period of time. It is important for researchers to study the long-term effects of intervention programs to ensure that these programs are working and significantly benefiting the students to which these programs are administered.

This study has demonstrated that a substantial percentage of vocabulary knowledge remained stable over the year following the intervention. The average student from the current study retained approximately half of the vocabulary knowledge that they gained in second grade a year later. On the decontextualized task, the average student learned about 17 words in second grade and retained knowledge of about 11 of these learned words (65%) in third grade. On the

expressive task, the average student learned about 19 words in second grade and retained knowledge of about 8 of these learned words (42%) in third grade.

Students in this study demonstrated some retention of knowledge of words on both the decontextualized measure and the expressive measure, but retention rates were stronger on the decontextualized measure. The reason for this difference may have been in the way that these two measures differ in the way they were scored. The decontextualized measure was scored as correct, partially correct and incorrect, so students who somewhat remembered the definition of the word were still considered to have retained knowledge of the word. In contrast, the expressive measure provided the students with a picture and a definition of the target word, and then asked the student to provide the correct word. It is possible that even though contextual clues were provided, this measure was more challenging because it required the students to recall the exact target word and was scored only as correct or incorrect. In addition, the expressive measure did not count synonyms as correct. For example, if the examiner said, “What word means ‘really big’” and the student said “gigantic” when the target word was “enormous,” this would be counted as an incorrect response even though it is a correct word for the definition.

The average student with a high IQ score from the current study retained more than half of the vocabulary knowledge that they gained in second grade a year later. On the decontextualized task, the average high IQ student retained 71% of their learned word knowledge. On the expressive task, the average high IQ student retained 64% of their learned word knowledge. These averages show that students with high IQ scores generally learned and retained more vocabulary knowledge overall.

The average student with an identified disability from the current study retained less of the vocabulary knowledge that they gained in second grade a year later. On the decontextualized

task, the average student with an identified disability retained 53% of their learned word knowledge. On the expressive task, the average student with an identified disability retained 31% of their learned word knowledge. These averages show that students with identified disabilities generally learned and retained less vocabulary knowledge overall.

Other research groups have reported similar differences in vocabulary retention for groups of students classified as at-risk and not-at-risk. Pullen et al. (2010) conducted a short-term retention test to measure the effectiveness of their tiered intervention program, where students who were identified as at-risk received more instruction than those who were identified as not-at-risk. They found that the at-risk students from their study lost their vocabulary knowledge over time, whereas the not at-risk students did not. The students in the Pullen et al. study were classified as at-risk versus not-at-risk based on their PPVT-4 (Dunn & Dunn, 2007) scores. If the student scored below the 39$^{th}$ percentile on the PPVT-4 they were identified as at-risk. As both the current study and the Pullen et al. study seem to indicate that students with identified disabilities or those who are at-risk of having a disability struggle the most with vocabulary learning and retention, it may be beneficial for future researchers to continue use of a tiered intervention model. In addition, perhaps future researchers could consider the possibility of providing the least instruction to those with high IQ scores, because this study seems to indicate that they have the strongest learning and retention rates of new vocabulary words. Perhaps this would create a more effective learning environment for the entire classroom.

**Limitations**

The results of this study should be interpreted with consideration of the following limitations. First, it should be noted that this study is strictly a descriptive study; no formal statistics were conducted. Although the results of this study seem to indicate that participants

retained much of what they had learned a year prior, it may be beneficial in the future to conduct a similar experiment using formal statistics to analyze the retention rates of the students and to determine what percent of retention can be considered statistically significant.

Second, out of the 146 students who received the vocabulary intervention, 63 students were available for retention testing. All students who were available for testing were tested. The students from second grade who were not tested again in third grade had either changed schools or moved out of town. It cannot be determined whether the results of this study would have differed had all 146 students who received the intervention been available to be tested for retention. In the future, it may be beneficial for researchers who choose to conduct a similar study to attempt to test a larger percentage of the students for retention testing to see whether results differ dramatically.

Third, the current study only measured retention one year following the intervention. It is impossible to determine whether the results of this study would have been similar to other studies that measured retention after a shorter period of time (e.g., 6 weeks after the intervention was completed). In the future, researchers may want to measure short-term and long-term retention, to determine how retention rates differ. Fourth, when analyzing the retention of words on the decontextualized task, the current study considered a partially correct response as retained knowledge. A more stringent test for future research would be to not include partially correct responses when analyzing retention of words.

Fifth, the current study did not measure whether the students were inadvertently exposed to the words being tested for retention within the year following the intervention. It is possible that these students were exposed to the taught vocabulary words either within the context of the home or within the school setting within the year. While the teachers were not made aware of

what vocabulary words were taught in the intervention, it is possible that the school's curriculum and the words taught in the intervention may have had some overlap.

The current study provides insight into what kind of information students tend to remember a year after intervention. As the retention rates were higher overall on the decontextualized measure than on the expressive measure, this could possibly be interpreted to mean that students tend to remember more general information about a word, like how a word may be used in a context or the general definition of a word, whereas precise words and precise definitions seem to be lost over time. The decontextualized measure allowed the student the opportunity to explain their general knowledge of a word, and this was considered either partially correct or correct. However, on the expressive measure, the student had only the chance to provide the correct target word, and if they provided the wrong word, even if it was a correct synonym for the target word, this was still scored incorrect. This information is helpful in assisting in the design of future studies where a high retention rate of vocabulary words is the goal. If the goal of a future researcher was for students to remember precise definitions, they may choose to focus more time on helping students memorize definitions. If the goal of a future researcher was for students to have a general, conceptual understanding of the target vocabulary words, then they may choose to conduct a study similar to the current study. In either instance, having a clear understanding of the depth of knowledge that students retain over longer periods of time is helpful in designing interventions that will have long-term benefits.

The purpose of this study was to examine the long-term retention rates of third grade students from low SES homes. Students were taught 6 Tier 2 target words per week for 18 weeks throughout their second grade school year. One year after the intervention was completed, students were tested to measure their retention of vocabulary knowledge gained throughout the

intervention using two measures: decontextualized and expressive. Initial results indicated that this 15-minute supplement of vocabulary instruction was successful in increasing acquisition of rather challenging vocabulary. In addition, students maintained much of their understanding of word learning one year after instruction without review or practice. After the intervention was completed, the students did not review the words they had learned. Also, recall that the words that were tested for retention were words that 25% to 75% of students received a score of correct on, meaning that the words that most students learned and that few students learned were eliminated. It is likely, then, that had the words that most students learned not been eliminated, the retention scores would have been even higher. Retention gets weaker over time without review, so retaining about half of the words learned can be considered successful in the current study.

Table 1

*Participant Information*

| Age | | | KBIT-2 | | | PPVT-4 | | | EVT-2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean | SD | Range | Mean | SD | Range | Mean | SD | Range | Mean | SD | Range |
| 9;5 | 0;6 | 8;0-10;6 | 95 | 15.4 | 60-135 | 93 | 14.1 | 64-135 | 95 | 11.8 | 58-127 |

*Note*. *N* = 63. Participant information recorded in second grade. Age – years;months; KBIT-2= Kaufman Brief Intelligence Test – Second Edition (Kaufman & Kaufman, 2005); PPVT-4= Peabody Picture Vocabulary Test – Fourth Edition (Dunn & Dunn, 2007); EVT-2= Expressive Vocabulary Test – Second Edition (Williams, 1997); *M* of 100 and *SD* of 15.

Table 2

*Second and Third Grade Decontextualized Vocabulary Retention Averaged Across Participants*

| | | 2nd Grade Vocabulary Learning | | | |
|---|---|---|---|---|---|
| | | Incorrect | Partially Correct | Correct | Total |
| 3rd Grade Vocabulary Retention | Incorrect | 51% | 7% | 16% | 74% |
| | Partially Correct | 4% | 2% | 5% | 11% |
| | Correct | 5% | 1% | 9% | 15% |
| | Total | 60% | 10% | 30% | |

*Note.* $N = 63$. Percentages are based on 42 words tested for retention.

Table 3

*Second and Third Grade Expressive Vocabulary Retention Averaged Across Participants*

| | | 2nd Grade Vocabulary Learning | | |
|---|---|---|---|---|
| | | Incorrect | Correct | Total |
| 3rd Grade Vocabulary Retention | Incorrect | 50% | 32% | 82% |
| | Correct | 5% | 14% | 19% |
| | Total | 55% | 46% | |

*Note.* $N = 63$. Percentages are based on 42 words tested for retention.

Table 4

*Second and Third Grade Decontextualized Vocabulary Retention Averaged Across Participants with an IQ of 115 or Greater*

| | | 2nd Grade Vocabulary Learning | | | |
|---|---|---|---|---|---|
| | | Incorrect | Partially Correct | Correct | Total |
| 3rd Grade Vocabulary Retention | Incorrect | 15% | 3% | 30% | 48% |
| | Partially Correct | 3% | 3% | 14% | 20% |
| | Correct | 8% | 3% | 21% | 32% |
| | Total | 26% | 9% | 65% | |

*Note.* $N = 7$. Percentages are based on 42 words tested for retention.

Table 5

*Second and Third Grade Expressive Vocabulary Retention Averaged Across Participants with an IQ of 115 or Greater*

| | | 2nd Grade Vocabulary Learning | | |
|---|---|---|---|---|
| | | Incorrect | Correct | Total |
| 3rd Grade Vocabulary Retention | Incorrect | 24% | 35% | 59% |
| | Correct | 10% | 32% | 42% |
| | Total | 34% | 67% | |

*Note.* $N = 7$. Percentages are based on 42 words tested for retention.

Table 6

*Second and Third Grade Decontextualized Vocabulary Retention Averaged Across Participants with an IQ Lower than 115*

| | | 2nd Grade Vocabulary Learning | | | |
|---|---|---|---|---|---|
| | | Incorrect | Partially Correct | Correct | Total |
| 3rd Grade Vocabulary Retention | Incorrect | 55% | 7% | 15% | 77% |
| | Partially Correct | 5% | 2% | 4% | 11% |
| | Correct | 4% | 1% | 7% | 12% |
| | Total | 64% | 10% | 26% | |

*Note*. $N = 56$. Percentages are based on 42 words tested for retention.

Table 7

*Second and Third Grade Expressive Vocabulary Retention Averaged Across Participants with an IQ Lower than 115*

| | | 2nd Grade Vocabulary Learning | | |
|---|---|---|---|---|
| | | Incorrect | Correct | Total |
| 3rd Grade Vocabulary Retention | Incorrect | 53% | 31% | 84% |
| | Correct | 4% | 12% | 16% |
| | Total | 57% | 43% | |

*Note.* $N = 56$. Percentages are based on 42 words tested for retention.

Table 8

*Second and Third Grade Decontextualized Vocabulary Retention Averaged Across Participants with Identified Disabilities*

| | | 2nd Grade Vocabulary Learning | | | |
|---|---|---|---|---|---|
| | | Incorrect | Partially Correct | Correct | Total |
| 3rd Grade Vocabulary Retention | Incorrect | 58% | 9% | 14% | 81% |
| | Partially Correct | 4% | 2% | 3% | 9% |
| | Correct | 3% | 1% | 7% | 11% |
| | Total | 65% | 12% | 24% | |

*Note*. $N = 14$. Percentages are based on 42 words tested for retention.

Table 9

*Second and Third Grade Expressive Vocabulary Retention Averaged Across Participants with Identified Disabilities*

| | | 2nd Grade Vocabulary Learning | | |
|---|---|---|---|---|
| | | Incorrect | Correct | Total |
| 3rd Grade Vocabulary Retention | Incorrect | 60% | 28% | 88% |
| | Correct | 3% | 9% | 12% |
| | Total | 63% | 37% | |

*Note.* $N = 14$. Percentages are based on 42 words tested for retention.

Table 10

*Second and Third Grade Decontextualized Vocabulary Retention Averaged Across Participants with No Identified Disabilities*

| | | 2nd Grade Vocabulary Learning | | | |
|---|---|---|---|---|---|
| | | Incorrect | Partially Correct | Correct | Total |
| 3rd Grade Vocabulary Retention | Incorrect | 49% | 6% | 17% | 72% |
| | Partially Correct | 5% | 3% | 6% | 14% |
| | Correct | 5% | 1% | 9% | 15% |
| | Total | 59% | 10% | 32% | |

*Note*. $N = 49$. Percentages are based on 42 words tested for retention.

Table 11

*Second and Third Grade Expressive Vocabulary Retention Averaged Across Participants with No Identified Disabilities*

| | | 2nd Grade Vocabulary Learning | | |
|---|---|---|---|---|
| | | Incorrect | Correct | Total |
| 3rd Grade Vocabulary Retention | Incorrect | 47% | 33% | 80% |
| | Correct | 5% | 15% | 20% |
| | Total | 52% | 48% | |

*Note.* $N = 49$. Percentages are based on 42 words tested for retention.

Figure 1. Model Retention Table: Layout of How the Results Were Derived From the Tables

| | | 2nd Grade Vocabulary Learning | | | |
|---|---|---|---|---|---|
| | | Incorrect | Partially Correct | Correct | Total |
| 3rd Grade Vocabulary Retention | Incorrect | Stable | Decreased | Decreased | |
| | Partially Correct | Increased | Stable | Decreased | |
| | Correct | Increased | Increased | Stable | |
| | Total | | | | |

*Figure 1*. Demonstration of how the tables were analyzed and interpreted. The data along the diagonal is where word knowledge remained stable from second to third grade. The data from the top right cells is where word knowledge decreased from second to third grade. The data from the bottom left cells is where word knowledge increased from second to third grade.

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